

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2003-065320

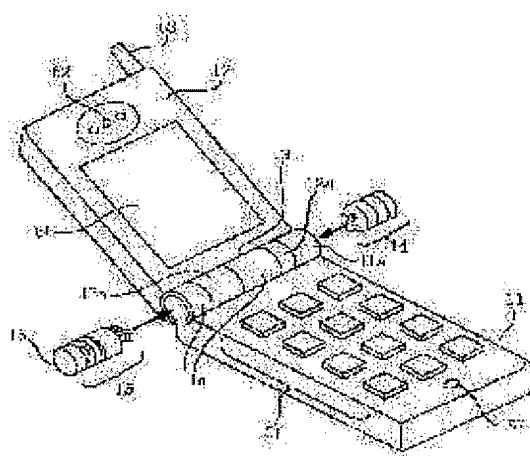
(43)Date of publication of application : 05.03.2003

(51)Int.Cl. F16C 11/10
F16F 9/12
H04M 1/02
H04M 1/03

(21)Application number : 2001-259004 (71)Applicant : NEC SAITAMA LTD

(22)Date of filing : 29.08.2001 (72)Inventor : KOBAYASHI FUMIYUKI

(54) FOLDING TYPE PORTABLE TELEPHONE



11 第一ケース
12 第二ケース
13 ヒンジ部
14 ダンパユニット
15 ヒンジユニット
16 ロック解除ボタン
17 ディスプレイ
18 キーパッド
19 マイク
20 イヤホン
21 バッテリー
22 アンテナ
23 スピーカー
24 カメラ
25 照明部
26 センサ
27 アクチュエータ
28 モータ
29 発電機
30 送信機
31 受信機
32 プロセッサ
33 メモリ
34 入力装置
35 出力装置
36 通信インターフェース
37 電源部
38 制御部
39 ステータス表示部
40 警報部
41 タイマ
42 カレンダー
43 計算機
44 ゲーム
45 アプリケーション
46 ソフトウェア
47 ハードウェア
48 ファームウェア
49 ミッドウェア
50 オペレーティングシステム
51 カーネル
52 ユーザーインターフェース
53 ネットワーク
54 プロトコル
55 標準
56 仕様
57 要件
58 制約
59 条件
60 前提
61 基礎
62 基盤
63 土台
64 支持
65 中核
66 核心
67 心臓
68 魂
69 精神
70 本質
71 物質
72 物
73 材料
74 要素
75 構成要素
76 部品
77 部分
78 区画
79 領域
80 区画
81 部分
82 区画
83 部分
84 区画
85 部分
86 区画
87 部分
88 区画
89 部分
90 区画

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a folding type portable telephone which can be quickly opened when a call is necessary and has little fear of falling due to reaction of the quick opening.

SOLUTION: A hinge part 13 for connecting a first case 11 and a second case 12 has such a structure that is provided with a hinge unit 15 having an one-touch opening function and also a damper unit 14 having a rotary damper function. The hinge unit 15 has such one-touch opening function that the second case 12 is immediately opened because of turning energy stored in a twisted coil spring arranged in the

hinge part 13, when a lock-releasing button 16 is pushed. In this case, when the second case 12 is opened up to a predetermined angle β , vanes arranged on a shaft of the damper unit 14 begin to turn. When the vanes turn, the turning speed of the

shaft is suppressed by viscous resistance of the oil sealed in the case of the damper unit 14. As a result, the opening speed of the second case 12 is suppressed when the second case 12 is opened more than the predetermined angle β .

CLAIMS

[Claim(s)]

[Claim 1] In a folded-up type portable telephone with which the 1st case and the 2nd case are connected via a hinge region enabling free rotation, A torque grant means to give torque in the direction mutually opened to said 1st case and said 2nd case, A locking mechanism held in the state where resisted torque given by said torque grant means, and said 1st case and said 2nd case were folded up, A lock release mechanism for releasing said locking mechanism, and a damper mechanism which eases speed of rotation brought about by said torque grant means when said locking mechanism is released, A folded-up type portable telephone functioning as a damper only where it ****(ed) and said damper mechanism is opened as for more than an angle predetermined in said 1st case and said 2nd case.

[Claim 2] The folded-up type portable telephone according to claim 1, wherein said damper mechanism is installed in said one hinge region side.

[Claim 3] The folded-up type portable telephone according to claim 2, wherein said damper mechanism is constituted with a rotary oil damper.

[Claim 4] The folded-up type portable telephone comprising according to claim 3:

An axis in which said rotary oil damper has a resistance part in contact with oil.

A case which stores said resistance part of said axis with oil, and an axis extension which is connected with said axis and extends on the outside of said case.

[Claim 5] Said case is stored by rotation impossible to this 1st body in the 1st body that is formed in said 1st case in one, and constitutes said a part of hinge region, and said axis extension, In the 2nd body that is formed in said 2nd case in one, and constitutes said a part of hinge region, The folded-up type portable telephone according to claim 4 which does not bar rotation of the 2nd body within said predetermined angle, and is characterized by being stored in the 2nd body and a mode which rotates in one above said predetermined angle.

[Claim 6] The folded-up type portable telephone according to claim 5 which said axis extension makes shape of an abbreviated rectangular parallelepiped, and is

characterized by a breakthrough of shape where sectional shape of an outline vertical to an axis has arranged two fans to point symmetry being established by said 2nd body. [Claim 7]The folded-up type portable telephone according to any one of claims 1 to 6, wherein a hinge mechanism characterized by comprising the following is installed. To the another side side of said hinge region, it is said torque grant means. Said locking mechanism and said lock release mechanism.

[Claim 8]The folded-up type portable telephone according to claim 7, wherein a pressing part of a push button which constitutes said a part of lock release mechanism is allocated in the end face of said hinge region.

[Claim 9]The folded-up type portable telephone according to claim 8, wherein said locking mechanism is provided with the 1st and 2nd lock member arranged so that it may have unevenness and both unevenness may be engaged and engagement of said 1st and 2nd lock member is solved by press of said push button.

[Claim 10]The folded-up type portable telephone according to claim 9, wherein said 1st and 2nd lock member is accommodated in a fixing cylinder which accommodates a helical compression spring which presses said 2nd lock member in the direction of said pressing part of said push button, and a torsion coil spring which constitutes said torque grant means.

[Claim 11]Said fixing cylinder is stored by rotation impossible to this 2nd body in the 2nd body that is formed in said 2nd case in one, and constitutes said a part of hinge region, and said torsion coil spring, It is attached to said fixing cylinder by one end, and the other end, The folded-up type portable telephone according to claim 10 attaching to the 1st lock member combined with a fixed disk stored by rotation impossible to this 1st body in the 1st body that is formed in said 1st case in one, and constitutes said a part of hinge region by rotation impossible.

[Claim 12]A folded-up type portable telephone of the one-touch open type according to any one of claims 1 to 6 by which said locking mechanism and said lock release mechanism are installing-in addition to said hinge region characterized.

[Claim 13]The folded-up type portable telephone according to any one of claims 1 to 12, wherein said 1st case is equipped with a final controlling element and a microphone and said 2nd case is equipped with an indicator and a receiver.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to control of the operation which shifts to a talk state (opened condition) from the state (closed state) folded up especially about the structure of the folded-up type portable telephone of the one-touch open type which can be used simple.

[0002]

[Description of the Prior Art] When opening the folded-up type portable telephone which does not have a one-touch open function from the state where it closed, opening only single hand was difficult for it, generally both hands needed to open two cases and the operation only by one hand was difficult. Then, the folded-up type portable telephone which has a function (one-touch open function) automatically changed into an opening (opening) state from the state folded up only by pushing the button was developed by providing a push button etc. in the end face of a hinge region so that only one hand could be operated easily. As this type of a conventional example, there are some which were indicated in JP,11-41328,A, for example. According to this conventional example, it has a spring which carries out rotational energization in the direction which opens a case, and a locking mechanism held in the state where the case was folded up, The button of which a lock is canceled is provided in the hinge region end face, and since it has structure which a case can open by operation of only one hand, it has the strong point in which operativity is excellent. Namely, the indicator side case and an operation key side case are usually in the folded-up state. If a lock release button is pushed in order to talk over the telephone, a lock will be canceled in one-touch. The indicator side case opens at a stretch to an operation key side case on the torque of the Lemna trisulca joule part currently stored in the spring which can come, simultaneously carries out rotational energization.

[0003] However, in this conventional example, when pushing a push button and opening a portable telephone at a stretch, there was a danger of dropping the portable telephone currently held in the hand according to that counteraction. This point is coped with and ***** structure is also indicated by the above-mentioned gazette by operation of a rotary oil damper. Since there are few dangers of falling from a hand according to the counteraction produced when a case opens the structure by this rotary oil-damper method at a stretch, they are effective from a viewpoint of safety. However, in order to take time to open thoroughly on the other hand, when it is necessary to talk over the telephone promptly, stress is sensed, and it has the fault that user-friendliness worsens on the contrary. In recent years, a miniaturization and weight saving other than simplicity are further required of a portable telephone.

[0004]

[Problem(s) to be Solved by the Invention]The technical problem of this invention is the problem of the conventional example mentioned above solving, and the purpose, It is possible 1st to be able to operate it only single hand, to be in an opened condition promptly, and to talk over the telephone immediately, and. It is enabling it to provide the folded-up type portable telephone which has the safety which a damper method has, and is enabling it to realize the 1st above-mentioned purpose to the 2nd, without being accompanied by enlargement of a device.

[0005]

[Means for Solving the Problem]In a folded-up type portable telephone with which the 1st case and the 2nd case are connected via a hinge region according to this invention enabling free rotation in order to attain the above-mentioned purpose, A torque grant means to give torque in the direction mutually opened to said 1st case and said 2nd case, A locking mechanism held in the state where resisted torque given by said torque grant means, and said 1st case and said 2nd case were folded up, A lock release mechanism for releasing said locking mechanism, and a damper mechanism which eases speed of rotation brought about by said torque grant means when said locking mechanism is released, Folded-up type portable telephone ** functioning as a damper only where it ****(ed) and said damper mechanism is opened as for more than an angle predetermined in said 1st case and said 2nd case is provided.

[0006]And an axis which has preferably a shuttlecock radiately extended to said one hinge region side, A case which stores said shuttlecock with oil, and an axis extension which is connected with said axis and extends on the outside of said case, A ***** rotary oil damper is installed as a damper member, and a hinge mechanism which equipped the another side side of said hinge region with said torque grant means, said locking mechanism, and said lock release mechanism is installed.

[0007]

[Embodiment of the Invention]Next, it is attached to an embodiment of the invention, is based on an example, and explains in detail with reference to drawings.

(The whole outline) The outline of the entire configuration of the folded-up type portable telephone of one example of this invention is first explained with reference to drawing 1 and drawing 2. Drawing 1 is the whole outline perspective view. Drawing 2 is the whole outline side view, and shows the state (opened condition; the state 3, the half-opening state; state 2, drawing 2 (b)) where it opened with the state (the state 1, drawing 2 (a)) where it closed. As shown in drawing 1, a folded-up type portable telephone has two cases, the 1st case 11 and the 2nd case 12. The 1st case 11 is

equipped with the key button 51 and the microphone 52 grade, and, on the other hand, the 2nd case 12 is equipped with the indicator 61, the receiver 62, and antenna 63 grade. As for these 1st cases 11 and the 2nd case 12, via the hinge region 13, two cases are connected so that rotation (opening and closing) may become possible mutually. In the hinge region 13, it is equipped with the hinge unit 15 which has a one-touch open function, and the damper unit 14 which has a rotary oil-damper function, respectively. The hinge region 13 is constituted by the 1st case 11, the body 11a formed in one, and the 2nd case 12 and the body 12a formed in one. In the tip part of the damper unit 14 and the hinge unit 15. The damper unit 14 and the hinge unit 15 from the state which the snap fitting containing a slit is provided and was illustrated by drawing 1. If an arrow direction is equipped in a hinge region, respectively, the snap fitting formed in each tip part will engage with the body 12a, and "escaping" from the hinge region 13 will be prevented, respectively. The hinge unit 15 comprises lock release button 16 grade which is a manual operation button at the time of canceling the torsion coil spring for energizing torque in the direction which opens the 1st case 11 and 2nd case 12 of each other, the locking mechanism holding the state where it closed, and a locking mechanism. The torque to which a locked position is canceled and the 1st case 11 and 2nd case 12 hold the torsion coil spring as a result can open automatically to an opened condition (the angle alpha of drawing 2 (b)) by pushing the lock release button 16 (one-touch open function).

[0008]On the other hand, the damper unit 14 comprises an axis, a case, a damping oil, a cap, etc. Although a rotary oil-damper function does not act to a certain predetermined angle beta (drawing 2 (b)), the damper unit 14 has taken the composition on which a rotary oil-damper function acts, if beta is exceeded. That is, if the predetermined angle beta is exceeded, when the axis extension attached to the axis contacts the stopper part of the body 12a of the 2nd case 12, a rotary oil-damper function will be exhibited. At this time, when rotation of the shuttlecock attached to the axis is controlled by the viscous resistance of the damping oil with which it filled up in the case, the speed at which the 1st case 11 and 2nd case 12 are opened wide is controlled.

[0009]Next, a motion of the whole folded-up type portable telephone of this example is explained. In the one-touch-type folded-up type portable telephone of this invention, the motion in the case of opening to an opened condition (drawing 2 (b); state 3) from the state (drawing 2 (a); state 1) which closed the 1st case 11 and 2nd case 12 is explained with reference to drawing 1 and drawing 2. If the lock release button 16 of the hinge unit 15 is pressed, the torque currently stored in the torsion

coil spring will be released, and the power rotated from a 0-degree state (drawing 2 (a); state 1) to the angle alpha will commit the 2nd case. However, although the predetermined angle beta (for example, $\beta = 90$ degrees, drawing 2 (b); state 2) is opened at a stretch, release speed will be controlled by the damper effect which the damper unit 14 has, and the 2nd case will be slowly opened, if the angle which the 1st case 11 and the 2nd case 12 accomplish exceeds beta. And eventually, the end 11c of the 1st case 11 and the end 12d of the 2nd case 12 contact in the position of the angle alpha of an opened condition (drawing 2 (b); state 3), and opening motion is completed. In an opened condition, the angle alpha is held by this contact. (The detailed structure of the damper unit 14 and its operation are mentioned later.) In [as explained in addition above] this invention, Since it is possible to make it function within a hinge region as for all of a one-touch open function and a rotary oil-damper function, it does not result in enlargement of a portable telephone.

[0010](Hinge unit) Next, the detailed structure of the hinge unit 15 and its operation are explained with reference to drawing 3 and drawing 4. It is an exploded perspective view of the hinge region with which the sectional view in the state which shows the state where the body of the 1st case 11 of the hinge unit 15 and the body of the 2nd case 12 were equipped with drawing 3 where it closed, and drawing 4 (a) connect the exploded perspective view of the hinge unit 15 with, and drawing 4 (b) connects the 1st case 11 and 2nd case 12. As shown in drawing 3 and drawing 4, the fixed disk 41 is inserted in the inside of the 1st case 11 and the body 11a formed in one. And the key groove 41a is formed in the peripheral face of the fixed disk 41, and the key 11d is formed in the inner skin of the body 11a, respectively, and since the key 11d has geared with the key groove 41a mutually, it cannot be rotated by the fixed disk 41 and the 1st case 11 of each other. The fixing cylinder 42 is formed in center-section slippage (right-hand side of a figure) of the fixed disk 41. In the lock release button 16 of the fixing cylinder 42, the snap fitting 42a is formed in the end face of the opposite hand, and thereby, the fixing cylinder 42 is fixed so that it may not fall out to the 2nd case 12. A part of peripheral face of the fixing cylinder 42 is cut off so that it may become planate, and it is made by the flat-surface cut part 42b. And it is cut off so that a part of inner wall side of the body 12a where the fixing cylinder 42 is inserted may become planate, and it is made by the flat-surface cut part 12c. When the flat-surface cut part 42b of the fixing cylinder 42 and the flat-surface cut part 12c of the body 12a are engaged, it becomes impossible therefore, to be rotated by the fixing cylinder 42 to the 2nd case 12, if the fixing cylinder 42 is inserted in the body 12a. That is, both rotate in one.

[0011]Inside the fixing cylinder 42, the 1st lock member 44, torsion coil spring 43, lock member 45, and helical compression spring 46 are stored (drawing 3), and rotation of the fixing cylinder 42 and the 1st lock member 44 is possible mutually. [2nd] On the other hand, it is impossible that the fixing cylinder 42 and the 2nd lock member 45 of each other rotate when the key 45a formed in the oblong hole 42c formed in the fixing cylinder 42 at the 2nd lock member 45 is engaged. However, movement to the shaft orientations of the 2nd lock member 45 is made possible by forming the length of the oblong hole 42c for a long time from the length of the shaft orientations of the key 45a. The tip part of the 1st lock member 44 is projected from the fixing cylinder 42 through the inside of the torsion coil spring 43, and is inserted into the fixed disk 41. And rotating mutually is impossible when the key 44a formed in the key groove 41b formed in the inner skin of the fixed disk 41 at the tip peripheral part of the 1st lock member 44 is engaged. The bent part 43a is formed in the both ends of the torsion coil spring 43. And one bent part is inserted and fixed to the crevice 42d formed in the fixing cylinder 42, and the bent part 43a of another side is being inserted and fixed to the crevice 44d formed in the 1st lock member 44. Thereby, the torque accumulated in the torsion coil spring 43 is transmitted to the body 11a and the body 12a of a case.

[0012]The pin part 16a of the lock release button 16 has penetrated the fixed disk 41, the torsion coil spring 43, the fixing cylinder 42, the 1st lock member 44, and the 2nd lock member 45, When the snap fitting formed in the tip part 16b engages with the end face of the 2nd lock member 45, the "escaping" is prevented. The shaft part 45b of the 2nd lock member 45 is inserted into the shaft hole 44b of the 1st lock member 44, and the end face 45c touches the flange 16c formed in the pin part 16a of the lock release button 16. The helical compression spring 46 is held in the state where it was compressed, between the end face of the 2nd lock member 45, and the internal surface of the fixing cylinder 42, therefore the 2nd lock member 45 is always energized rightward [of the figure]. Although the 1st lock member 44 and 2nd lock member 45 have a pivotable structure mutually, they will be in the state where rotation is mutually impossible, in the state where the heights 44c of the 1st lock member 44 and the crevice 45d of the 2nd lock member 45 are being engaged (locked position). Where the folded-up type portable telephone of this invention is closed, the 2nd lock member 45 is pressed in the direction of the 1st lock member 44 by the elastic force of the helical compression spring 46. Therefore, the crevice 45d of the 2nd lock member 45 and the heights 44c of the 1st lock member 44 are in an engagement state, and it cannot rotate.

[0013]In the state by which it was shown in drawing 3, if the lock release button 16 is

pushed in, when the flange 16c of the lock release button 16 presses the end face 45c of the 2nd lock member 45, The 2nd lock member 45 moves the inside of the fixing cylinder 42 rightward [of a figure], resisting the elastic force of the helical compression spring 46. At this time, while the inclined plane of the heights 44c which are in the 1st lock member 44 on the torque which the torsion coil spring 43 has touches the inclined plane of the crevice 45d in the 2nd lock member 45, it rotates. If the flange 16c of the lock release button 16 is furthermore promoted, The 2nd lock member 45 is pushed in further, the locked position of the crevice 45d of the 2nd lock member 45 and the heights 44c of the 1st lock member 44 is canceled, and the torque currently stored in the torsion coil spring 43 at the moment is released at a stretch.

[0014] Since the both ends of the torsion coil spring 43 are being fixed to the fixing cylinder 42 and the 1st lock member 44, respectively at this time, the power which the fixing cylinder 42 and the 1st lock member 44 rotate mutually works. Here, it is assumed that it has the 1st case 11 by hand, and is fixing. Since the key 11d and the key groove 41a are being engaged, the 1st case 11 and fixed disk 41 cannot be rotated. Since the key groove 41b and the key 44a are being engaged, the fixed disk 41 and the 1st lock member 44 cannot be rotated. Therefore, the 1st lock member 44 is fixed to the 1st case 11 (it does not rotate). Therefore, the torque stored in the torsion coil spring 43 is committed so that the fixing cylinder 42 may be rotated. Since the flat-surface cut part 42b of the fixing cylinder 42 touches the flat-surface cut part 12c of the body 12a and rotates the body 12a in one with the fixing cylinder 42 at this time, the torque which acts on the fixing cylinder 42 acts to the 2nd case 12 via the body 12a. Therefore, the 2nd case 12 is wide opened at a stretch on the torque stored in the torsion coil spring 43. From this opened condition, by changing the 1st case 11 and 2nd case 12 into the state where it closed mutually, the torsion coil spring 43 is twisted again and torque is conserved. That is, when shifting to the state where it closed, if the body 12a rotates, the fixing cylinder 42 will also rotate simultaneously. At this time, torque is stored in the fixing cylinder 42 and the torsion coil spring 43 fixed to the 1st lock member 44. Simultaneously, when the heights 44c of the 1st lock member 44 and the crevice 45d of the 2nd lock member 45 are engaged, it is locked where the torque of the torsion coil spring 43 is maintained.

[0015](Damper unit) Next, the structure of the damper unit 14 and operation are explained with reference to drawing 5 and drawing 6. The sectional view in a section parallel to the axial center of the damper unit 14 and drawing 5 (c) of the exploded perspective view and drawing 5 (b) which drawing 5 (a) shows the component of the damper unit 14 are the sectional views in a section vertical to the axial center of the

damper unit 14. Drawing 6 (a) is an exploded perspective view showing the shape of the body of the 1st case 11 and the 2nd case 12 where the damper unit 14 is equipped. Drawing 6 (b) thru/or (d) is a sectional view showing the state where the abbreviated rectangular parallelepiped part 31b of the axis 31 touches the field of the adjusting angle hole 12b established by the body 12a combined with the 2nd case 12. As shown in drawing 5, the axis 31 has the snap fitting 31c formed in two or more shuttlecocks 31a radiately prolonged from a shaft part, the abbreviated rectangular parallelepiped part 31b which carried out shape of the outline rectangular parallelepiped, and the tip part of the abbreviated rectangular parallelepiped part 31b. The damper unit 14 encloses the portion of the shuttlecock 31a of the axis 31 in the case 32 using the cap 34 with the damping oil 33 which has moderate viscosity. The axis 31 and the case 32 are in the relation between an axis and a bearing, and rotation inside the case 32 is possible for the axis 31 (it can rotate freely). However, in order that the viscous resistance of the damping oil 33 might act to the shuttlecock 31a of the axis 31, the revolving speed to the case 32 of the axis 31 was controlled. Most cases 32 are inserted into the body 11a of the 1st case 11, and the abbreviated rectangular parallelepiped part 31b is inserted into the body 12a of the 2nd case 12. "Escaping" from the hinge region of the damper unit 14 is prevented by the engagement to the body 12a of the snap fitting 31c.

[0016]As shown in drawing 6 (a), the flat-surface cut part 11b is formed in the inner skin of the body 11a. As shown in drawing 5 (a) and (c), the case 32 of the damper unit 14 cannot be rotated to the 1st case 11 within the body 11a of the 1st case 11 by forming the flat-surface cut part 32a in the cylindrical peripheral face as for the case 32. On the other hand, the hole of the shape of a character of "8" of the outline number of shape which doubled with point symmetry 1/4 yen which the section extended for a while two is established by the body 12a of the 2nd case 12 as the adjusting angle hole 12b. That rotation is regulated when the abbreviated rectangular parallelepiped part 31b of the axis 31 inserted in the body 12a contacts the field of this adjusting angle hole 12b.

[0017]Next, with reference to drawing 6 (b) - (d), a motion of the 2nd case 12 and the axis 31 is explained in detail. Where the 1st case 11 and 2nd case 12 are folded up, as shown in drawing 6 (b), two fields and 31b-1 which the abbreviated rectangular parallelepiped part 31b of the axis 31 opposes, and 31b-2 are in the state where field 12b-4 of the adjusting angle hole 12b in the body 12a and 12b-1 were touched, respectively. When shifting to an opened condition from the state which the 1st case 11 and 2nd case 12 closed, the 2nd case 12 rotates to clockwise direction in space.

From the state (0 degree) which the angle which the 1st case 11 and the 2nd case 12 accomplish closed before the angle beta. In order that field 12b-1 of adjusting angle hole 12b - 12b-4 may not contact field 31b-1 of abbreviated rectangular parallelepiped part 31b, and 31b-2, the 2nd case 12 rotates in the free state to the axis 31. And in order that damper mechanism may not act in the meantime, the torque currently stored in the torsion coil spring 43 opens the 2nd case 12 with sufficient vigor to the 1st case 11.

[0018]If the 1st case 11 rotates only the angle beta to the 2nd case 12, as shown in drawing 6 (c), field 12b-2 of adjusting angle hole 12b and 12b-3 will contact field 31b-2 of the abbreviated rectangular parallelepiped part 31b, and 31b-1. And between beta and alpha, a difference angle rotates the body 12a with the axis 31 with the abbreviated rectangular parallelepiped part 31b, in order that the field of the adjusting angle hole 12b may continue contact to the field of the abbreviated rectangular parallelepiped part 31b. Since speed regulation of the shuttlecock 31a to rotate is carried out by the viscous resistance by a damping oil at this time, release speed is controlled and the 2nd case 12 is slowly opened to the 1st case 11 to the opened condition shown in drawing 6 (d). Here, it is possible by adjusting beforehand the angle of the arc part of the adjusting angle hole 12b to set up arbitrarily the angle beta which an operation of a rotary oil damper starts. The effect of a rotary oil-damper function can be adjusted by selecting properly the viscosity of a damping oil, the number of sheets of a shuttlecock, etc.

[0019]Although the desirable example was described above, within limits which are not limited to this example and do not deviate from the gist of this invention, a proper change is possible for this invention. For example, although the flat-surface cut part was provided in the case 32, the body 11a, etc. and rotation impossible nature was realized in the example, it may be made to achieve this function by replacing with this method, while establishing a crevice for heights in another side, and engaging unevenness. The attachment to the 2nd lock member of a lock release button may be replaced with a snap fitting, and a caulking may perform it. It is not necessary to necessarily provide a shuttlecock in the axis of a damper unit for example, and the axis itself may receive the resistance to rotation with the viscosity of oil. It may be made to provide a locking mechanism and a lock release mechanism in the housing body [not a hinge region but] side. For example, a hook is provided in either and a hook engaging part is provided in the other, and it enables it for a push button to cancel engagement, or a magnet is formed in both housing bodies, it is considered as a lock function, one magnet is moved, and it may be made to perform lock release.

[0020]

[Effect of the Invention] Since the torque stored in the spring to a certain predetermined angle β opens promptly the folded-up type portable telephone by this invention, and damper mechanism acts and it is made to open at a loose speed if the angle β is surpassed, The counteraction by opening rapidly is cancelable, and it becomes possible to make it open wide for a short time. Therefore, according to this invention, it is avoidable to make it fall according to the counteraction at the time of opening, and the stress in the case of being opened wide slowly is cancelable. Since these functions can be exhibited with the device with which the inside of a hinge region was equipped, they can be realized without enlarging a portable telephone. The motion at the time of opening has contrast, and a high grade feeling can be brewed.

TECHNICAL FIELD

[Field of the Invention] This invention relates to control of the operation which shifts to a talk state (opened condition) from the state (closed state) folded up especially about the structure of the folded-up type portable telephone of the one-touch open type which can be used simple.

PRIOR ART

[Description of the Prior Art] When opening the folded-up type portable telephone which does not have a one-touch open function from the state where it closed, opening only single hand was difficult for it, generally both hands needed to open two cases and the operation only by one hand was difficult. Then, the folded-up type portable telephone which has a function (one-touch open function) automatically changed into an opening (opening) state from the state folded up only by pushing the button was developed by providing a push button etc. in the end face of a hinge region so that only one hand could be operated easily. As this type of a conventional example, there are some which were indicated in JP,11-41328,A, for example. According to this conventional example, it has a spring which carries out rotational energization in the direction which opens a case, and a locking mechanism held in the state where the case was folded up, The button of which a lock is canceled is provided in the hinge region end face, and since it has structure which a case can open by operation of only one hand, it has the strong point in which operativity is excellent. Namely, the indicator side case and an operation key side case are usually in the folded-up state.

If a lock release button is pushed in order to talk over the telephone, a lock will be canceled in one-touch. The indicator side case opens at a stretch to an operation key side case on the torque of the Lemna trisulca joule part currently stored in the spring which can come, simultaneously carries out rotational energization.

[0003]However, in this conventional example, when pushing a push button and opening a portable telephone at a stretch, there was a danger of dropping the portable telephone currently held in the hand according to that counteraction. This point is coped with and ***** structure is also indicated by the above-mentioned gazette by operation of a rotary oil damper. Since there are few dangers of falling from a hand according to the counteraction produced when a case opens the structure by this rotary oil-damper method at a stretch, they are effective from a viewpoint of safety. However, in order to take time to open thoroughly on the other hand, when it is necessary to talk over the telephone promptly, stress is sensed, and it has the fault that user-friendliness worsens on the contrary. In recent years, a miniaturization and weight saving other than simplicity are further required of a portable telephone.

EFFECT OF THE INVENTION

[Effect of the Invention]Since the torque stored in the spring to a certain predetermined angle β opens promptly the folded-up type portable telephone by this invention, and damper mechanism acts and it is made to open at a loose speed if the angle β is surpassed, The counteraction by opening rapidly is cancelable, and it becomes possible to make it open wide for a short time. Therefore, according to this invention, it is avoidable to make it fall according to the counteraction at the time of opening, and the stress in the case of being opened wide slowly is cancelable. Since these functions can be exhibited with the device with which the inside of a hinge region was equipped, they can be realized without enlarging a portable telephone. The motion at the time of opening has contrast, and a high grade feeling can be brewed.

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention]The technical problem of this invention is the problem of the conventional example mentioned above solving, and the purpose, It is possible 1st to be able to operate it only single hand, to be in an opened condition promptly, and to talk over the telephone immediately, and. It is enabling it to provide the folded-up type portable telephone which has the safety which a damper method

has, and is enabling it to realize the 1st above-mentioned purpose to the 2nd, without being accompanied by enlargement of a device.

MEANS

[Means for Solving the Problem]In a folded-up type portable telephone with which the 1st case and the 2nd case are connected via a hinge region according to this invention enabling free rotation in order to attain the above-mentioned purpose, A torque grant means to give torque in the direction mutually opened to said 1st case and said 2nd case, A locking mechanism held in the state where resisted torque given by said torque grant means, and said 1st case and said 2nd case were folded up, A lock release mechanism for releasing said locking mechanism, and a damper mechanism which eases speed of rotation brought about by said torque grant means when said locking mechanism is released, Folded-up type portable telephone ** functioning as a damper only where it ****(ed) and said damper mechanism is opened as for more than an angle predetermined in said 1st case and said 2nd case is provided.

[0006]And an axis which has preferably a shuttlecock radiately extended to said one hinge region side, A case which stores said shuttlecock with oil, and an axis extension which is connected with said axis and extends on the outside of said case, A ***** rotary oil damper is installed as a damper member, and a hinge mechanism which equipped the another side side of said hinge region with said torque grant means, said locking mechanism, and said lock release mechanism is installed.

[0007]

[Embodiment of the Invention]Next, it is attached to an embodiment of the invention, is based on an example, and explains in detail with reference to drawings.

(The whole outline) The outline of the entire configuration of the folded-up type portable telephone of one example of this invention is first explained with reference to drawing 1 and drawing 2. Drawing 1 is the whole outline perspective view. Drawing 2 is the whole outline side view, and shows the state (opened condition; the state 3, the half-opening state; state 2, drawing 2 (b)) where it opened with the state (the state 1, drawing 2 (a)) where it closed. As shown in drawing 1, a folded-up type portable telephone has two cases, the 1st case 11 and the 2nd case 12. The 1st case 11 is equipped with the key button 51 and the microphone 52 grade, and, on the other hand, the 2nd case 12 is equipped with the indicator 61, the receiver 62, and antenna 63 grade. As for these 1st cases 11 and the 2nd case 12, via the hinge region 13, two cases are connected so that rotation (opening and closing) may become possible

mutually. In the hinge region 13, it is equipped with the hinge unit 15 which has a one-touch open function, and the damper unit 14 which has a rotary oil-damper function, respectively. The hinge region 13 is constituted by the 1st case 11, the body 11a formed in one, and the 2nd case 12 and the body 12a formed in one. In the tip part of the damper unit 14 and the hinge unit 15. The damper unit 14 and the hinge unit 15 from the state which the snap fitting containing a slit is provided and was illustrated by drawing 1. If an arrow direction is equipped in a hinge region, respectively, the snap fitting formed in each tip part will engage with the body 12a, and "escaping" from the hinge region 13 will be prevented, respectively. The hinge unit 15 comprises lock release button 16 grade which is a manual operation button at the time of canceling the torsion coil spring for energizing torque in the direction which opens the 1st case 11 and 2nd case 12 of each other, the locking mechanism holding the state where it closed, and a locking mechanism. The torque to which a locked position is canceled and the 1st case 11 and 2nd case 12 hold the torsion coil spring as a result can open automatically to an opened condition (the angle alpha of drawing 2 (b)) by pushing the lock release button 16 (one-touch open function).

[0008]On the other hand, the damper unit 14 comprises an axis, a case, a damping oil, a cap, etc. Although a rotary oil-damper function does not act to a certain predetermined angle beta (drawing 2 (b)), the damper unit 14 has taken the composition on which a rotary oil-damper function acts, if beta is exceeded. That is, if the predetermined angle beta is exceeded, when the axis extension attached to the axis contacts the stopper part of the body 12a of the 2nd case 12, a rotary oil-damper function will be exhibited. At this time, when rotation of the shuttlecock attached to the axis is controlled by the viscous resistance of the damping oil with which it filled up in the case, the speed at which the 1st case 11 and 2nd case 12 are opened wide is controlled.

[0009]Next, a motion of the whole folded-up type portable telephone of this example is explained. In the one-touch-type folded-up type portable telephone of this invention, the motion in the case of opening to an opened condition (drawing 2 (b); state 3) from the state (drawing 2 (a); state 1) which closed the 1st case 11 and 2nd case 12 is explained with reference to drawing 1 and drawing 2. If the lock release button 16 of the hinge unit 15 is pressed, the torque currently stored in the torsion coil spring will be released, and the power rotated from a 0-degree state (drawing 2 (a); state 1) to the angle alpha will commit the 2nd case. However, although the predetermined angle beta (for example, beta= 90 degrees, drawing 2 (b); state 2) is opened at a stretch, release speed will be controlled by the damper effect which the

damper unit 14 has, and the 2nd case will be slowly opened, if the angle which the 1st case 11 and the 2nd case 12 accomplish exceeds beta. And eventually, the end 11c of the 1st case 11 and the end 12d of the 2nd case 12 contact in the position of the angle alpha of an opened condition (drawing 2 (b); state 3), and opening motion is completed. In an opened condition, the angle alpha is held by this contact. (The detailed structure of the damper unit 14 and its operation are mentioned later.) In [as explained in addition above] this invention, Since it is possible to make it function within a hinge region as for all of a one-touch open function and a rotary oil-damper function, it does not result in enlargement of a portable telephone.

[0010](Hinge unit) Next, the detailed structure of the hinge unit 15 and its operation are explained with reference to drawing 3 and drawing 4. It is an exploded perspective view of the hinge region with which the sectional view in the state which shows the state where the body of the 1st case 11 of the hinge unit 15 and the body of the 2nd case 12 were equipped with drawing 3 where it closed, and drawing 4 (a) connect the exploded perspective view of the hinge unit 15 with, and drawing 4 (b) connects the 1st case 11 and 2nd case 12. As shown in drawing 3 and drawing 4, the fixed disk 41 is inserted in the inside of the 1st case 11 and the body 11a formed in one. And the key groove 41a is formed in the peripheral face of the fixed disk 41, and the key 11d is formed in the inner skin of the body 11a, respectively, and since the key 11d has geared with the key groove 41a mutually, it cannot be rotated by the fixed disk 41 and the 1st case 11 of each other. The fixing cylinder 42 is formed in center-section slippage (right-hand side of a figure) of the fixed disk 41. In the lock release button 16 of the fixing cylinder 42, the snap fitting 42a is formed in the end face of the opposite hand, and thereby, the fixing cylinder 42 is fixed so that it may not fall out to the 2nd case 12. A part of peripheral face of the fixing cylinder 42 is cut off so that it may become planate, and it is made by the flat-surface cut part 42b. And it is cut off so that a part of inner wall side of the body 12a where the fixing cylinder 42 is inserted may become planate, and it is made by the flat-surface cut part 12c. When the flat-surface cut part 42b of the fixing cylinder 42 and the flat-surface cut part 12c of the body 12a are engaged, it becomes impossible therefore, to be rotated by the fixing cylinder 42 to the 2nd case 12, if the fixing cylinder 42 is inserted in the body 12a. That is, both rotate in one.

[0011]Inside the fixing cylinder 42, the 1st lock member 44, torsion coil spring 43, lock member 45, and helical compression spring 46 are stored (drawing 3), and rotation of the fixing cylinder 42 and the 1st lock member 44 is possible mutually. [2nd] On the other hand, it is impossible that the fixing cylinder 42 and the 2nd lock member 45 of

each other rotate when the key 45a formed in the oblong hole 42c formed in the fixing cylinder 42 at the 2nd lock member 45 is engaged. However, movement to the shaft orientations of the 2nd lock member 45 is made possible by forming the length of the oblong hole 42c for a long time from the length of the shaft orientations of the key 45a. The tip part of the 1st lock member 44 is projected from the fixing cylinder 42 through the inside of the torsion coil spring 43, and is inserted into the fixed disk 41. And rotating mutually is impossible when the key 44a formed in the key groove 41b formed in the inner skin of the fixed disk 41 at the tip peripheral part of the 1st lock member 44 is engaged. The bent part 43a is formed in the both ends of the torsion coil spring 43. And one bent part is inserted and fixed to the crevice 42d formed in the fixing cylinder 42, and the bent part 43a of another side is being inserted and fixed to the crevice 44d formed in the 1st lock member 44. Thereby, the torque accumulated in the torsion coil spring 43 is transmitted to the body 11a and the body 12a of a case.

[0012]The pin part 16a of the lock release button 16 has penetrated the fixed disk 41, the torsion coil spring 43, the fixing cylinder 42, the 1st lock member 44, and the 2nd lock member 45. When the snap fitting formed in the tip part 16b engages with the end face of the 2nd lock member 45, the "escaping" is prevented. The shaft part 45b of the 2nd lock member 45 is inserted into the shaft hole 44b of the 1st lock member 44, and the end face 45c touches the flange 16c formed in the pin part 16a of the lock release button 16. The helical compression spring 46 is held in the state where it was compressed, between the end face of the 2nd lock member 45, and the internal surface of the fixing cylinder 42, therefore the 2nd lock member 45 is always energized rightward [of the figure]. Although the 1st lock member 44 and 2nd lock member 45 have a pivotable structure mutually, they will be in the state where rotation is mutually impossible, in the state where the heights 44c of the 1st lock member 44 and the crevice 45d of the 2nd lock member 45 are being engaged (locked position). Where the folded-up type portable telephone of this invention is closed, the 2nd lock member 45 is pressed in the direction of the 1st lock member 44 by the elastic force of the helical compression spring 46. Therefore, the crevice 45d of the 2nd lock member 45 and the heights 44c of the 1st lock member 44 are in an engagement state, and it cannot rotate.

[0013]In the state by which it was shown in drawing 3, if the lock release button 16 is pushed in, when the flange 16c of the lock release button 16 presses the end face 45c of the 2nd lock member 45, The 2nd lock member 45 moves the inside of the fixing cylinder 42 rightward [of a figure], resisting the elastic force of the helical compression spring 46. At this time, while the inclined plane of the heights 44c which

are in the 1st lock member 44 on the torque which the torsion coil spring 43 has touches the inclined plane of the crevice 45d in the 2nd lock member 45, it rotates. If the flange 16c of the lock release button 16 is furthermore promoted, The 2nd lock member 45 is pushed in further, the locked position of the crevice 45d of the 2nd lock member 45 and the heights 44c of the 1st lock member 44 is canceled, and the torque currently stored in the torsion coil spring 43 at the moment is released at a stretch.

[0014] Since the both ends of the torsion coil spring 43 are being fixed to the fixing cylinder 42 and the 1st lock member 44, respectively at this time, the power which the fixing cylinder 42 and the 1st lock member 44 rotate mutually works. Here, it is assumed that it has the 1st case 11 by hand, and is fixing. Since the key 11d and the key groove 41a are being engaged, the 1st case 11 and fixed disk 41 cannot be rotated. Since the key groove 41b and the key 44a are being engaged, the fixed disk 41 and the 1st lock member 44 cannot be rotated. Therefore, the 1st lock member 44 is fixed to the 1st case 11 (it does not rotate). Therefore, the torque stored in the torsion coil spring 43 is committed so that the fixing cylinder 42 may be rotated. Since the flat-surface cut part 42b of the fixing cylinder 42 touches the flat-surface cut part 12c of the body 12a and rotates the body 12a in one with the fixing cylinder 42 at this time, the torque which acts on the fixing cylinder 42 acts to the 2nd case 12 via the body 12a. Therefore, the 2nd case 12 is wide opened at a stretch on the torque stored in the torsion coil spring 43. From this opened condition, by changing the 1st case 11 and 2nd case 12 into the state where it closed mutually, the torsion coil spring 43 is twisted again and torque is conserved. That is, when shifting to the state where it closed, if the body 12a rotates, the fixing cylinder 42 will also rotate simultaneously. At this time, torque is stored in the fixing cylinder 42 and the torsion coil spring 43 fixed to the 1st lock member 44. Simultaneously, when the heights 44c of the 1st lock member 44 and the crevice 45d of the 2nd lock member 45 are engaged, it is locked where the torque of the torsion coil spring 43 is maintained.

[0015] (Damper unit) Next, the structure of the damper unit 14 and operation are explained with reference to drawing 5 and drawing 6. The sectional view in a section parallel to the axial center of the damper unit 14 and drawing 5 (c) of the exploded perspective view and drawing 5 (b) which drawing 5 (a) shows the component of the damper unit 14 are the sectional views in a section vertical to the axial center of the damper unit 14. Drawing 6 (a) is an exploded perspective view showing the shape of the body of the 1st case 11 and the 2nd case 12 where the damper unit 14 is equipped. Drawing 6 (b) thru/or (d) is a sectional view showing the state where the abbreviated rectangular parallelepiped part 31b of the axis 31 touches the field of the adjusting

angle hole 12b established by the body 12a combined with the 2nd case 12. As shown in drawing 5, the axis 31 has the snap fitting 31c formed in two or more shuttlecocks 31a radiately prolonged from a shaft part, the abbreviated rectangular parallelepiped part 31b which carried out shape of the outline rectangular parallelepiped, and the tip part of the abbreviated rectangular parallelepiped part 31b. The damper unit 14 encloses the portion of the shuttlecock 31a of the axis 31 in the case 32 using the cap 34 with the damping oil 33 which has moderate viscosity. The axis 31 and the case 32 are in the relation between an axis and a bearing, and rotation inside the case 32 is possible for the axis 31 (it can rotate freely). However, in order that the viscous resistance of the damping oil 33 might act to the shuttlecock 31a of the axis 31, the revolving speed to the case 32 of the axis 31 was controlled. Most cases 32 are inserted into the body 11a of the 1st case 11, and the abbreviated rectangular parallelepiped part 31b is inserted into the body 12a of the 2nd case 12. "Escaping" from the hinge region of the damper unit 14 is prevented by the engagement to the body 12a of the snap fitting 31c.

[0016]As shown in drawing 6 (a), the flat-surface cut part 11b is formed in the inner skin of the body 11a. As shown in drawing 5 (a) and (c), the case 32 of the damper unit 14 cannot be rotated to the 1st case 11 within the body 11a of the 1st case 11 by forming the flat-surface cut part 32a in the cylindrical peripheral face as for the case 32. On the other hand, the hole of the shape of a character of "8" of the outline number of shape which doubled with point symmetry $1/4$ yen which the section extended for a while two is established by the body 12a of the 2nd case 12 as the adjusting angle hole 12b. That rotation is regulated when the abbreviated rectangular parallelepiped part 31b of the axis 31 inserted in the body 12a contacts the field of this adjusting angle hole 12b.

[0017]Next, with reference to drawing 6 (b) – (d), a motion of the 2nd case 12 and the axis 31 is explained in detail. Where the 1st case 11 and 2nd case 12 are folded up, as shown in drawing 6 (b), two fields and 31b-1 which the abbreviated rectangular parallelepiped part 31b of the axis 31 opposes, and 31b-2 are in the state where field 12b-4 of the adjusting angle hole 12b in the body 12a and 12b-1 were touched, respectively. When shifting to an opened condition from the state which the 1st case 11 and 2nd case 12 closed, the 2nd case 12 rotates to clockwise direction in space. From the state (0 degree) which the angle which the 1st case 11 and the 2nd case 12 accomplish closed before the angle beta. In order that field 12b-1 of adjusting angle hole 12b – 12b-4 may not contact field 31b-1 of abbreviated rectangular parallelepiped part 31b, and 31b-2, the 2nd case 12 rotates in the free state to the

axis 31. And in order that damper mechanism may not act in the meantime, the torque currently stored in the torsion coil spring 43 opens the 2nd case 12 with sufficient vigor to the 1st case 11.

[0018]If the 1st case 11 rotates only the angle beta to the 2nd case 12, as shown in drawing 6 (c), field 12b-2 of adjusting angle hole 12b and 12b-3 will contact field 31b-2 of the abbreviated rectangular parallelepiped part 31b, and 31b-1. And between beta and alpha, a difference angle rotates the body 12a with the axis 31 with the abbreviated rectangular parallelepiped part 31b, in order that the field of the adjusting angle hole 12b may continue contact to the field of the abbreviated rectangular parallelepiped part 31b. Since speed regulation of the shuttlecock 31a to rotate is carried out by the viscous resistance by a damping oil at this time, release speed is controlled and the 2nd case 12 is slowly opened to the 1st case 11 to the opened condition shown in drawing 6 (d). Here, it is possible by adjusting beforehand the angle of the arc part of the adjusting angle hole 12b to set up arbitrarily the angle beta which an operation of a rotary oil damper starts. The effect of a rotary oil-damper function can be adjusted by selecting properly the viscosity of a damping oil, the number of sheets of a shuttlecock, etc.

[0019]Although the desirable example was described above, within limits which are not limited to this example and do not deviate from the gist of this invention, a proper change is possible for this invention. For example, although the flat-surface cut part was provided in the case 32, the body 11a, etc. and rotation impossible nature was realized in the example, it may be made to achieve this function by replacing with this method, while establishing a crevice for heights in another side, and engaging unevenness. The attachment to the 2nd lock member of a lock release button may be replaced with a snap fitting, and a caulking may perform it. It is not necessary to necessarily provide a shuttlecock in the axis of a damper unit for example, and the axis itself may receive the resistance to rotation with the viscosity of oil. It may be made to provide a locking mechanism and a lock release mechanism in the housing body [not a hinge region but] side. For example, a hook is provided in either and a hook engaging part is provided in the other, and it enables it for a push button to cancel engagement, or a magnet is formed in both housing bodies, it is considered as a lock function, one magnet is moved, and it may be made to perform lock release.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1]The entire configuration **** perspective view of one example of this invention.

[Drawing 2]The side view for explaining operation of one example of this invention.

[Drawing 3]The sectional view showing the state where the hinge region of the hinge unit used in the one example of this invention was equipped.

[Drawing 4]The exploded perspective view of the hinge unit used in the one example of this invention, and a hinge region.

[Drawing 5]The exploded perspective view and sectional view of a damper unit which are used in the one example of this invention.

[Drawing 6]The exploded perspective view of the hinge region of one example of this invention, and the explanatory view of a damper unit of operation.

[Description of Notations]

11 The 1st case

11a Body

11b Flat-surface cut part

11c End

11 d Key

12 The 2nd case

12a Body

12b Adjusting angle hole

12b-1-12b-4 Field of an adjusting angle hole

12c Flat-surface cut part

12 d End

13 Hinge region

14 Damper unit

15 Hinge unit

16 Lock release button

16a Pin part

16b Tip part

16c Flange

31 Axis

31a Shuttlecock

31b Abbreviated rectangular parallelepiped part

31b-1 and 31b-2 Field of an abbreviated rectangular parallelepiped part

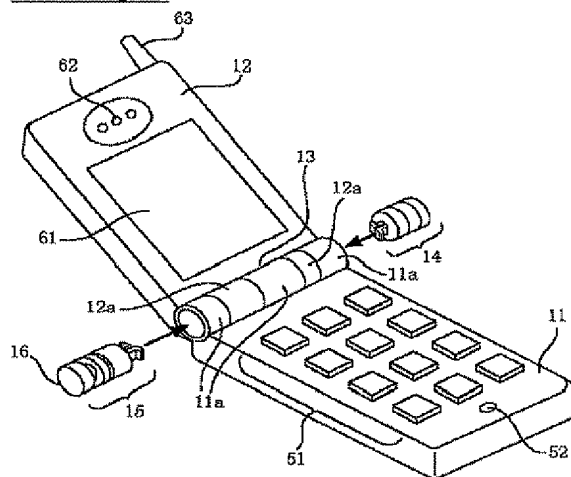
31c Snap fitting

32 Case

32a Flat-surface cut part
33 Damping oil
34 Cap
41 Fixed disk
41a, 41b key groove
42 Fixing cylinder
42a Snap fitting
42b Flat-surface cut part
42c Oblong hole
42 d Crevice
43 Torsion coil spring
43a Bent part
44 The 1st lock member
44a Key
44b Shaft hole
44c Heights
44 d Crevice
45 The 2nd lock member
45a Key
45b Shaft part
45c End face
45 d Crevice
46 Helical compression spring
51 Key button
52 Microphone
61 Indicator
62 Receiver
63 Antenna

DRAWINGS

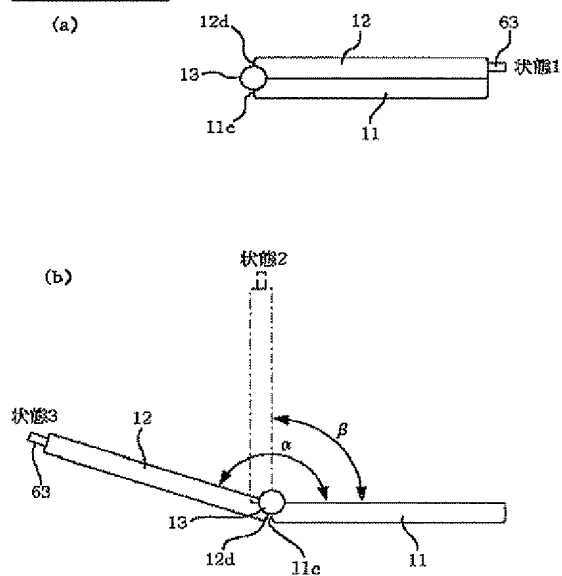
[Drawing 1]



(図1)

- | | | |
|----------|-------------|---------|
| 11 第1の筐体 | 14 ダンパーユニット | 52 マイク |
| 11a 円筒部 | 15 ヒンジユニット | 61 表示部 |
| 12 第2の筐体 | 16 ロック解除ボタン | 62 受信器 |
| 12a 円筒部 | 51 キーボタン | 63 アンテナ |
| 13 ヒンジ部 | | |

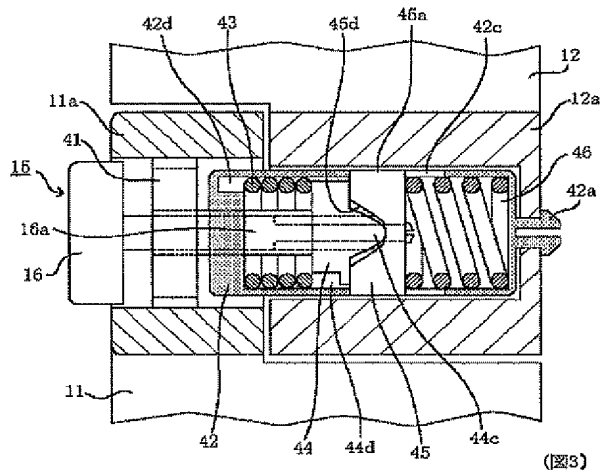
[Drawing 2]



11c、12d 端部

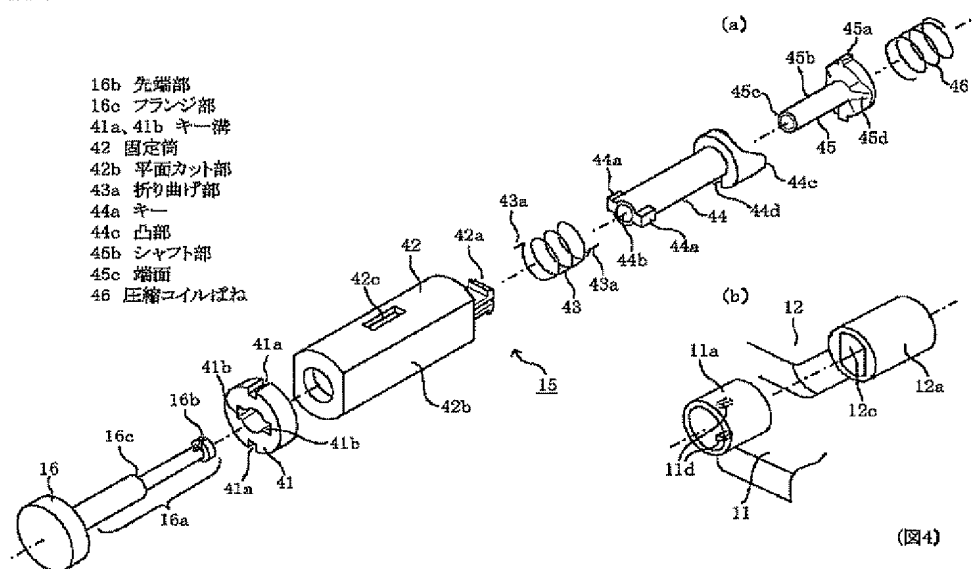
(図2)

[Drawing 3]

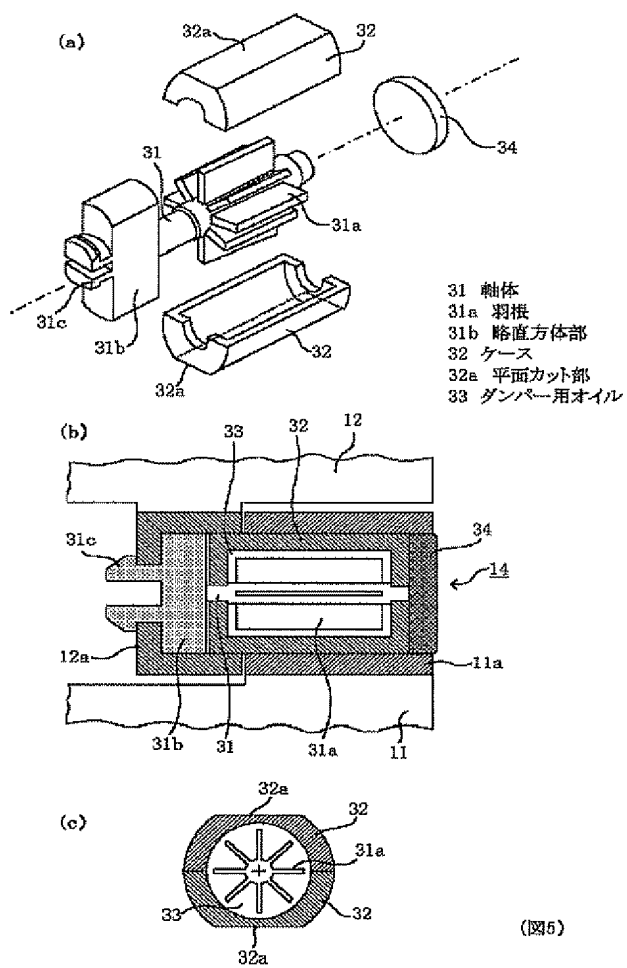


- | | | | |
|-----|----------|----------|----------|
| 43 | ねじりコイルばね | 16a | ピン部 |
| 44 | 第1のロック部材 | 41 | 固定ディスク |
| 44d | 凹部 | 42a | スナップフィット |
| 45 | 第2のロック部材 | 42c | 長穴 |
| 45a | キー | 42d, 45d | 凹部 |

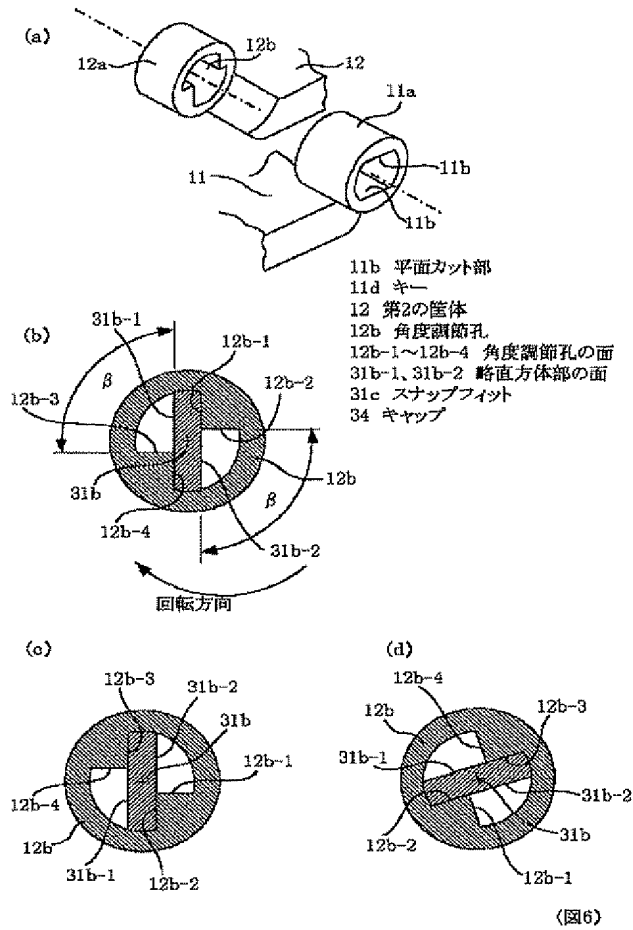
[Drawing 4]



[Drawing 5]



[Drawing 6]



[Translation done.]

(19) 日本国特許庁 (J P)

(12) 公開特許公報 (A)

(11) 特許出願公開番号

特開2003-65320

(P2003-65320A)

(43) 公開日 平成15年3月5日 (2003.3.5)

(51) Int.Cl.⁷

識別記号

F I

テマコード* (参考)

F 1 6 C 11/10

F 1 6 C 11/10

C 3 J 0 6 9

F 1 6 F 9/12

F 1 6 F 9/12

3 J 1 0 5

H 0 4 M 1/02

H 0 4 M 1/02

C 5 K 0 2 3

1/03

1/03

Z

審査請求 有 請求項の数13 O L (全 9 頁)

(21) 出願番号 特願2001-259004(P2001-259004)

(22) 出願日 平成13年8月29日 (2001.8.29)

(71) 出願人 390010179

埼玉日本電気株式会社

埼玉県児玉郡神川町大字元原字豊原300番
18

(72) 発明者 小林 文幸

埼玉県児玉郡神川町大字元原字豊原300番
18 埼玉日本電気株式会社内

(74) 代理人 100096253

弁理士 尾身 祐助

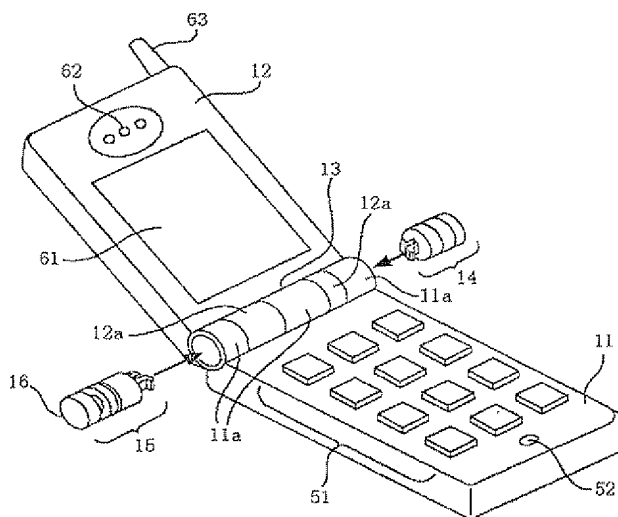
最終頁に続く

(54) 【発明の名称】 折り畳み型携帯電話機

(57) 【要約】

【課題】 通話が必要ときに速やかに開放状態になり、かつ、そのときの反動により落下する可能性の少ない携帯電話機を提供する。

【構成】 第1の筐体11と第2の筐体12の連結部であるヒンジ部13に、ワンタッチオープン機能を持つヒンジユニット部15と、ロータリーダンパー機能を持つダンパーユニット部14とをあわせ持つ構成とする。ヒンジユニット部15は、ロック解除ボタン16を押すとヒンジ部に装備してあるねじりコイルバネに蓄えられていた回転力の作用により、直ちに第2の筐体12が開放状態に移行するワンタッチオープン機能を有する。このとき、第2の筐体12が所定の角度 β まで開くと、ダンパーユニット部14の軸体に装備された羽根が回転する。この羽根が回転すると、ダンパーユニット部14のケース中に密封されているオイルの粘性抵抗の作用により、軸体の回転速度は抑制される。この結果、所定の角度 β を越えると、第2の筐体12の開放速度が抑制される。



(図1)

11 第1の筐体

11a 円筒部

12 第2の筐体

12a 円筒部

13 ヒンジ部

14 ダンパーユニット

15 ヒンジユニット

16 ロック解除ボタン

51 キーボタン

52 マイク

61 表示部

62 受話器

63 アンテナ

【特許請求の範囲】

【請求項 1】 第 1 の筐体と、第 2 の筐体とがヒンジ部を介して回転自在に連結されている折り畳み型携帯電話機において、前記第 1 の筐体と前記第 2 の筐体に対し互いに開く方向に回転力を付与する回転力付与手段と、前記回転力付与手段によって付与される回転力に抗して前記第 1 の筐体と前記第 2 の筐体が折り畳まれた状態に保持するロック機構と、前記ロック機構を解放するためのロック解放機構と、前記ロック機構が解放された際に前記回転力付与手段によってもたらされる回転の速度を緩和するダンパー機構と、を有し、且つ、前記ダンパー機構は前記第 1 の筐体と前記第 2 の筐体とが所定の角度以上開いた状態でのみダンパーとして機能することを特徴とする折り畳み型携帯電話機。

【請求項 2】 前記ヒンジ部の一方の側に、前記ダンパー機構が設置されていることを特徴とする請求項 1 記載の折り畳み型携帯電話機。

【請求項 3】 前記ダンパー機構が、ロータリーオイルダンパーにより構成されていることを特徴とする請求項 2 記載の折り畳み型携帯電話機。

【請求項 4】 前記ロータリーオイルダンパーが、オイルと接触する抵抗部を有する軸体と、前記軸体の前記抵抗部をオイルと共に収納するケースと、前記軸体に連結され前記ケースの外側に延在する軸体延長部と、を備えていることを特徴とする請求項 3 記載の折り畳み型携帯電話機。

【請求項 5】 前記ケースは、前記第 1 の筐体に一体的に形成され前記ヒンジ部の一部を構成する第 1 の円筒部に該第 1 の円筒部に対し回転不能に収納され、前記軸体延長部は、前記第 2 の筐体に一体的に形成され前記ヒンジ部の一部を構成する第 2 の円筒部内に、前記所定の角度以内では第 2 の円筒部の回転を妨げることが無く、前記所定の角度以上では第 2 の円筒部と一体的に回転する態様にて収納されていることを特徴とする請求項 4 記載の折り畳み型携帯電話機。

【請求項 6】 前記軸体延長部は略直方体の形状をなし、前記第 2 の円筒部には、軸線に垂直な概略の断面形状が、扇を点対称に 2 つ配置した形状の貫通孔が開設されていることを特徴とする請求項 5 記載の折り畳み型携帯電話機。

【請求項 7】 前記ヒンジ部の他方の側に、前記回転力付与手段と、前記ロック機構と、前記ロック解放機構と、を備えたヒンジ機構が設置されていることを特徴とする請求項 1 ～ 6 のいずれかに記載の折り畳み型携帯電話機。

【請求項 8】 前記ヒンジ部の端面に、前記ロック解放機構の一部を構成する押しボタンの押圧部が配設されていることを特徴とする請求項 7 記載の折り畳み型携帯電話機。

【請求項 9】 前記ロック機構が、凹凸を有し両者の凹

凸に係合するように配置される第 1、第 2 のロック部材を備え、前記押しボタンの押圧により、前記第 1、第 2 のロック部材の係合が解かれることを特徴とする請求項 8 記載の折り畳み型携帯電話機。

【請求項 10】 前記第 1、第 2 のロック部材が、前記第 2 のロック部材を前記押しボタンの前記押圧部の方向に押圧する圧縮コイルばねと、前記回転力付与手段を構成するねじりコイルばねとを収容する固定筒内に収容されていることを特徴とする請求項 9 記載の折り畳み型携帯電話機。

【請求項 11】 前記固定筒は、前記第 2 の筐体に一体的に形成され前記ヒンジ部の一部を構成する第 2 の円筒部内に該第 2 の円筒部に対し回転不能に収納され、前記ねじりコイルばねは、一端が前記固定筒に取り付けられ、他端が、前記第 1 の筐体に一体的に形成され前記ヒンジ部の一部を構成する第 1 の円筒部内に該第 1 の円筒部に対し回転不能に収納された固定ディスクに回転不能に結合された第 1 のロック部材に取り付けられていることを特徴とする請求項 10 記載の折り畳み型携帯電話機。

【請求項 12】 前記ロック機構と前記ロック解放機構とが、前記ヒンジ部以外に設置されていることを特徴とする請求項 1 ～ 6 のいずれかに記載のワンタッチオープン式の折り畳み型携帯電話機。

【請求項 13】 前記第 1 の筐体には操作部およびマイクが装備され、前記第 2 の筐体には表示部および受話器が装備されていることを特徴とする請求項 1 ～ 12 のいずれかに記載の折り畳み型携帯電話機。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、簡便に使用できるワンタッチオープン式の折り畳み型携帯電話機の構造に関し、特に、折り畳んだ状態（閉じた状態）から通話状態（開放状態）に移行する動作の制御に関するものである。

【0002】

【従来の技術】ワンタッチオープン機能を有しない折り畳み型携帯電話機は、閉じた状態から開く際に片手だけで開くことは難しく、一般的に 2 つの筐体を両手によって開く必要があり、片手のみによる操作は困難であった。そこで、片手だけの操作を容易に行なえるように、ヒンジ部の端面に押しボタン等を設けることにより、そのボタンを押すだけで折り畳んだ状態から自動的にオープン（開放）状態にする機能（ワンタッチオープン機能）を有する折り畳み型携帯電話機が開発された。このタイプの従来例としては、例えば、特開平 11-41328 号公報において開示されたものがある。この従来例によれば、筐体を開く方向に回動付勢するばねと、筐体が折り畳まれた状態に保持するロック機構とを有し、ヒンジ部端面にロックを解除するボタンが設けられてお

10

20

30

40

50

り、片手だけの操作で筐体が開くことができる構造となっているため、操作性がすぐれるという長所を有する。すなわち、通常は、表示部側筐体と操作キー側筐体とは折り畳まれた状態である。通話するためにロック解除ボタンを押すと、ワンタッチにてロックが解除される。これと同時に、回動付勢するばねに蓄えられていたヒンジモジュール部の回転力により、表示部側筐体が操作キー側筐体に対して一気に開く。

【0003】しかしながら、この従来例においては、押しボタンを押して携帯電話機を一気に開くとき、その反動により手に保持していた携帯電話機を落下させたりする危険性があった。この点に対処して、上記の公報には、ロータリーオイルダンパーの作用により、ゆっくり開く構造も開示されている。このロータリーオイルダンパー方式による構造は、筐体が一気に開くときに生じる反動により手から落下する危険性は少ないため、安全性の観点からは有効である。しかし、その一方で、完全に開くまでに時間を要するため、直ちに通話する必要のあるときにストレスを感じてしまい、かえって使い勝手が悪くなるという欠点を有している。また、近年において

【0004】

【発明が解決しようとする課題】本発明の課題は、上述した従来例の問題点を解決することであって、その目的は、第1に、片手だけで操作が可能であり、迅速に開放状態となりすぐに通話することが可能であると共に、ダンパー方式が持つ安全性を有している折り畳み型携帯電話機を提供できるようにすることであり、第2に、上記の第1の目的を、装置の大型化を伴わずに実現できるようにすることである。

【0005】

【課題を解決するための手段】上記の目的を達成するため、本発明によれば、第1の筐体と、第2の筐体とがヒンジ部を介して回転自在に連結されている折り畳み型携帯電話機において、前記第1の筐体と前記第2の筐体に対し互いに開く方向に回転力を付与する回転力付与手段と、前記回転力付与手段によって付与される回転力に抗して前記第1の筐体と前記第2の筐体が折り畳まれた状態に保持するロック機構と、前記ロック機構を解放するためのロック解放機構と、前記ロック機構が解放された際に前記回転力付与手段によってもたらされる回転の速度を緩和するダンパー機構と、を有し、且つ、前記ダンパー機構は前記第1の筐体と前記第2の筐体とが所定の角度以上開いた状態でのみダンパーとして機能することを特徴とする折り畳み型携帯電話機、が提供される。

【0006】そして、好ましくは、前記ヒンジ部の一方の側に、放射状に伸びる羽根を有する軸体と、前記羽根をオイルと共に収納するケースと、前記軸体に連結され前記ケースの外側に延在する軸体延長部と、を備えたロ

ータリーオイルダンパーがダンパー部材として設置され、前記ヒンジ部の他方の側に、前記回転力付与手段と、前記ロック機構と、前記ロック解放機構と、を備えたヒンジ機構が設置される。

【0007】

【発明の実施の形態】次に、本発明の実施の形態について、実施例に即して図面を参照して詳細に説明する。

(全体の概要) まず、本発明の一実施例の折り畳み型携帯電話機の全体構成の概要について、図1、図2を参照して説明する。図1は全体の概略斜視図である。また、図2は全体の概略側面図であり、閉じた状態(状態1、図2(a))と開いた状態(開放状態; 状態3、半開状態; 状態2、図2(b))を示したものである。図1に示すように、折り畳み型携帯電話機は、第1の筐体11と第2の筐体12の2つの筐体を有する。第1の筐体11にはキーボタン51、マイク52等が装備されており、一方、第2の筐体12には表示部61、受話器62、アンテナ63等が装備される。これら第1の筐体11と第2の筐体12は、ヒンジ部13を介して、2つの筐体は互いに回転(開閉)が可能になるように、連結されている。またヒンジ部13内にはワンタッチオープン機能を有するヒンジユニット15と、ロータリーオイルダンパー機能を有するダンパーユニット14がそれぞれ装着される。ヒンジ部13は、第1の筐体11と一体的に形成された円筒部11aと、第2の筐体12と一体的に形成された円筒部12aとにより構成されている。ダンパーユニット14とヒンジユニット15の先端部には、スリットの入ったスナッフフィットが設けられており、図1に図示された状態から、ダンパーユニット14とヒンジユニット15とは、それぞれ矢印方向にヒンジ部内に装着されると、それぞれの先端部に形成されたスナッフフィットが円筒部12aと係合され、それぞれヒンジ部13からの“抜け”が防止されるようになっている。ヒンジユニット15は、第1の筐体11と第2の筐体12を互いに開く方向に回転力を付勢するためのねじりコイルばねと、閉じた状態を保持するロック機構と、ロック機構を解除する際の操作ボタンであるロック解除ボタン16等から構成される。ロック解除ボタン16を押すことによりロック状態が解除されて、その結果、第1の筐体11と第2の筐体12が、ねじりコイルばねの保持している回転力により開放状態(図2(b)の角度 α)まで自動的に開く(ワンタッチオープン機能)ことができる。

【0008】一方、ダンパーユニット14は軸体、ケース、ダンパー用オイルおよびキャップ等から構成される。ダンパーユニット14は、ある所定の角度 β (図2(b))まではロータリーオイルダンパー機能は作用しないが、 β を越えるとロータリーオイルダンパー機能が作用する構成を採っている。すなわち、所定の角度 β を越えると、軸体に付設した軸体延長部が第2の筐体12

の円筒部12aのストッパ部に接触することにより、ロータリーオイルダンパー機能が発揮される。このとき、ケース内に充填されたダンパー用オイルの粘性抵抗により、軸体に付設された羽根の回転が抑制されることにより、第1の筐体11と第2の筐体12とが開放される速度が抑制される。

【0009】次に、本実施例の折り畳み型携帯電話機の全体の動きについて説明する。本発明のワンタッチ式の折り畳み型携帯電話機において、第1の筐体11と第2の筐体12を閉じた状態（図2（a）；状態1）から開放状態（図2（b）；状態3）に開く場合の動きについて、図1および図2を参照して説明する。ヒンジユニット15のロック解除ボタン16が押圧されると、ねじりコイルばねに蓄えられていた回転力が解放され、第2の筐体は0°の状態（図2（a）；状態1）から角度 α まで回転する力が働く。しかし、第2の筐体は、所定の角度 β （例えば $\beta=90^\circ$ 、図2（b）；状態2）までは一気に開くが、第1の筐体11と第2の筐体12の成す角度が β を越えると、ダンパーユニット14のもつダンパー効果により開放速度が抑制されてゆっくりと開く。そして、最終的には、開放状態の角度 α （図2（b）；状態3）の位置で第1の筐体11の端部11cと第2筐体12の端部12dとが接触して開放動作が終了する。この接触により開放状態においては角度 α を保持する。

（ダンパーユニット14の詳細構造およびその動作については後述する。）なお、以上説明したように、本発明においては、ワンタッチオープン機能およびロータリーオイルダンパー機能は、すべて、ヒンジ部内で機能させることが可能であるために、携帯電話機の大小型化に至ることはない。

【0010】（ヒンジユニット）次に、ヒンジユニット15の詳細構造およびその動作について、図3、図4を参照して説明する。図3は、ヒンジユニット15の、第1の筐体11の円筒部と第2の筐体12の円筒部に装着した状態を示す閉じた状態での断面図、図4（a）はヒンジユニット15の分解斜視図、図4（b）は第1の筐体11と第2の筐体12とを連結するヒンジ部の分解斜視図である。図3、図4に示すように、固定ディスク41は、第1の筐体11と一体的に形成された円筒部11aの内部に挿入されている。そして、固定ディスク41の外周面にはキー溝41aが、円筒部11aの内周面にはキー11dが、それぞれ形成されており、キー溝41aとキー11dとが互いに噛み合っているため、固定ディスク41と第1の筐体11は互いに回転できない。固定ディスク41の中央部寄り（図の右側）には、固定筒42が設けられている。固定筒42のロック解除ボタン16とは反対側の端面にはスナッフフィット42aが設けられており、これにより、固定筒42は第2の筐体12に対して抜け落ちないように固定される。また、固定筒42の外周面の一部は平面状になるように切り取られ

て平面カット部42bになされている。そして、固定筒42の挿入される円筒部12aの内部壁面の一部も平面状になるように切り取られて平面カット部12cになされている。したがって、固定筒42が円筒部12aに挿入されると、固定筒42の平面カット部42bと、円筒部12aの平面カット部12cとが係合することにより、固定筒42は第2の筐体12に対して回転することができなくなる。すなわち、両者は一体的に回転する。

【0011】固定筒42の内部には、第1のロック部材44、ねじりコイルばね43、第2のロック部材45および圧縮コイルばね46が収納されており（図3）、固定筒42と第1のロック部材44とは互いに回転が可能になっている。一方、固定筒42と第2のロック部材45は、固定筒42に形成された長穴42cに第2のロック部材45に形成されたキー45aとが係合することにより、互いに回転することが不能になっている。しかし、キー45aの軸方向の長さより長穴42cの長さが長く形成されていることにより、第2のロック部材45の軸方向への移動は可能になされている。第1のロック部材44の先端部は、ねじりコイルばね43の内部を通して固定筒42から突出して、固定ディスク41内に挿入されている。そして、固定ディスク41の内周面に形成されたキー溝41bに第1のロック部材44の先端外周部に形成されたキー44aが係合することにより、互いに回転することが不能となっている。ねじりコイルばね43の両端部には、折り曲げ部43aが設けられている。そして、一方の折り曲げ部は固定筒42に形成された凹部42dに挿入されて固定され、他方の折り曲げ部43aは第1のロック部材44に形成された凹部44dに挿入されて固定されている。これにより、ねじりコイルばね43に蓄積された回転力が筐体の円筒部11aと円筒部12aとに伝達されるようになっている。

【0012】ロック解除ボタン16のピン部16aは、固定ディスク41、ねじりコイルばね43、固定筒42、第1のロック部材44、第2のロック部材45を貫通しており、その先端部16bに形成されたスナッフフィットが第2のロック部材45の端面と係合することにより、その“抜け”が防止されている。第2のロック部材45のシャフト部45bは、第1のロック部材44のシャフト穴44b内に挿入されており、その端面45cはロック解除ボタン16のピン部16aに形成されたフランジ部16cに接触している。圧縮コイルばね46は、圧縮された状態で第2のロック部材45の端面と固定筒42の内壁面との間に保持されており、従って、第2のロック部材45は、常時、図の右方向に付勢されている。第1のロック部材44と第2のロック部材45とは、互いに回転可能な構造になっているが、第1のロック部材44の凸部44cと第2のロック部材45の凹部45dが係合している状態では、互いに回転ができない状態になる（ロック状態）。本発明の折り畳み型携帯電

話機を閉じた状態では、第2のロック部材45は、圧縮コイルばね46の弾性力により第1のロック部材44の方向に押圧されている。そのため、第2のロック部材45の凹部45dと第1のロック部材44の凸部44cが係合状態にあり回転することはできない。

【0013】図3に示された状態において、ロック解除ボタン16が押し込まれると、ロック解除ボタン16のフランジ部16cが第2のロック部材45の端面45cを押圧することにより、第2のロック部材45は圧縮コイルばね46の弾性力に抗しつつ、固定筒42の内部を
10 図の右方向に移動する。このとき、ねじりコイルばね43の持つ回転力により第1のロック部材44にある凸部44cの傾斜面が第2のロック部材45にある凹部45dの傾斜面に接しながら回転する。さらにロック解除ボタン16のフランジ部16cが推し進められると、第2のロック部材45は更に押し込まれ、第2のロック部材45の凹部45dと第1のロック部材44の凸部44cとのロック状態が解除され、その瞬間に、ねじりコイルばね43に蓄えられていた回転力が一気に解放され
る。

【0014】このとき、ねじりコイルばね43の両端は、固定筒42と第1のロック部材44に、それぞれ固定されているため、固定筒42と第1のロック部材44とが互いに回転する力が働く。ここで、第1の筐体11を手で持って固定しているとす。第1の筐体11と固定ディスク41とは、キー11dとキー溝41aとが係合されているため回転が不能である。また、固定ディスク41と第1のロック部材44とは、キー溝41bとキー44aとが係合されているため回転が不能である。そのため、第1のロック部材44は、第1の筐体11に対して固定される（回転しない）。したがって、ねじりコイルばね43に蓄えられた回転力は、固定筒42を回転させるように働く。このとき、固定筒42の平面カット部42bが、円筒部12aの平面カット部12cと接触して
30 いて円筒部12aは固定筒42と一体的に回転するため、固定筒42に作用する回転力は、円筒部12aを介して第2の筐体12に対して作用する。したがって、第2の筐体12は、ねじりコイルばね43に蓄えられた回転力により一気に開放される。なお、この開放状態から、第1の筐体11と第2の筐体12とを互いに閉じた状態にすることにより、再びねじりコイルばね43がねじられて回転力が蓄えられる。すなわち、閉じた状態に移行するとき、円筒部12aが回転すると固定筒42も同時に回転する。このとき、固定筒42と第1のロック部材44に固定されたねじりコイルばね43に回転力が蓄えられる。同時に、第1のロック部材44の凸部44cと第2のロック部材45の凹部45dとが係合することにより、ねじりコイルばね43の回転力が維持された状態でロックされる。

【0015】（ダンパーユニット）次に、ダンパーユ

ット14の構造および動作について、図5、図6を参照して説明する。図5（a）はダンパーユニット14の構成要素を示す分解斜視図、図5（b）はダンパーユニット14の軸心と平行な断面での断面図、図5（c）はダンパーユニット14の軸心と垂直な断面での断面図である。また、図6（a）はダンパーユニット14が装備される第1の筐体11および第2の筐体12の円筒部の形状を示す分解斜視図である。さらに、図6（b）ないし（d）は、軸体31の略直方体部31bが、第2の筐体12と結合された円筒部12aに開設された角度調節孔12bの面と接触している状態を示す断面図である。図5に示すように、軸体31は、軸部分から放射状に延びる複数枚の羽根31aと、概略直方体の形状をした略直方体部31bと、略直方体部31bの先端部に形成されたスナップフィット31cを有する。ダンパーユニット14は、ケース32内に、軸体31の羽根31aの部分を適度な粘性を有するダンパー用オイル33と共にキャップ34を用いて封入したものである。軸体31とケース32は軸と軸受けの関係にあり、軸体31はケース32の内部での回転が可能である（回転自在である）。しかし、軸体31の羽根31aに対してダンパー用オイル33の粘性抵抗が作用するため、軸体31のケース32に対する回転速度は抑制されたものとなる。ケース32の大部分は、第1の筐体11の円筒部11a内に挿入され、略直方体部31bは、第2の筐体12の円筒部12a内に挿入される。スナップフィット31cの円筒部12aへの係合により、ダンパーユニット14のヒンジ部からの“抜け”は防止される。

【0016】図6（a）に示すように、円筒部11aの内周面には平面カット部11bが形成されている。また、図5（a）、（c）に示すように、ケース32は円筒の外周面に平面カット部32aが形成されていることにより、ダンパーユニット14のケース32は、第1の筐体11の円筒部11a内で第1の筐体11に対して回転が不能である。一方、第2の筐体12の円筒部12aには、断面が少し広げた1/4円を点対称に2つ合わせた形状の概略数字の“8”の字状の孔が、角度調節孔12bとして開設されている。円筒部12aに挿入された軸体31の略直方体部31bは、この角度調節孔12bの面と接触することにより、その回転が規制される。

【0017】次に、図6（b）～（d）を参照して、第2の筐体12と軸体31の動きについて詳細に説明する。第1の筐体11と第2の筐体12が折り畳まれた状態では、図6（b）に示すように、軸体31の略直方体部31bの対抗する二つの面、31b-1と31b-2は、それぞれ、円筒部12a内の角度調節孔12bの面12b-4、12b-1に接した状態にある。第1の筐体11と第2の筐体12とが閉じた状態から開放状態に移行するとき、第2の筐体12は紙面において時計回り方向に回転する。第1の筐体11と第2の筐体12の成
50

す角度が、閉じた状態 (0°) から角度 β までの間は、角度調節孔 12b の面 12b-1 ~ 12b-4 が略直方体部 31b の面 31b-1、31b-2 に接触することがないため、第 2 の筐体 12 は軸体 31 に対してフリーな状態で回転する。そして、この間は、ダンパー機能が作用することがないため、第 2 の筐体 12 は、第 1 の筐体 11 に対して、ねじりコイルばね 43 に蓄えられていた回転力によって、勢いよく開く。

【0018】第 1 の筐体 11 が第 2 の筐体 12 に対して角度 β だけ回転すると、図 6 (c) に示すように、角度調節孔 12b の面 12b-2、12b-3 が略直方体部 31b の面 31b-2、31b-1 に接触する。そして開き角度が β から α の間では、角度調節孔 12b の面が略直方体部 31b の面に接触を続けるため、円筒部 12a は、略直方体部 31b を伴って、すなわち軸体 31 を伴って回転する。このとき、回転する羽根 31a がダンパー用オイルによる粘性抵抗によって速度規制されるため、開放速度が抑制され、第 2 の筐体 12 は、図 6

(d) に示す開放状態まで第 1 の筐体 11 に対してゆっくりと開く。なお、ここで、角度調節孔 12b の円弧部の角度をあらかじめ調節しておくことにより、ロータリーオイルダンパーの作用が開始する角度 β を、任意に設定することが可能である。また、ダンパー用オイルの粘度、羽根の枚数等を適正に選定することにより、ロータリーオイルダンパー機能の効果を調節することができる。

【0019】以上好ましい実施例について説明したが、本発明はこの実施例に限定されるものではなく、本発明の要旨を逸脱しない範囲内において適宜の変更が可能なものである。例えば、実施例では、ケース 32 と円筒部 11a 等に平面カット部を設けて回転不能性を実現していたが、この方式に代え一方に凹部を、他方に凸部を設けて凹凸をかみ合わせることでこの機能を果たすようにしてもよい。また、ロック解除ボタンの第 2 のロック部材への取り付けは、スナップフィットに代えかしめによって行ってもよい。また、ダンパーユニットの軸体には必ずしも羽根を設ける必要はなく例えば軸自身がオイルの粘性により回転に対する抵抗を受けるものであってもよい。さらに、ロック機構とロック解除機構とはヒンジ部ではなく筐体本体側に設けるようにしてもよい。例えば、いずれか一方にフックを、他方にフック係合部を設け押しボタンにより係合を解除出来るようにしたり、両筐体本体に磁石を設けてロック機能とし、一方の磁石を移動させてロック解除を行うようにしてもよい。

【0020】

【発明の効果】本発明による折り畳み型携帯電話機は、ある所定の角度 β までバネに蓄えられた回転力により迅速に開き、その角度 β をこえるとダンパー機能が作用して緩やかな速度で開くようにしたものである。急激に開くことによる反動を解消することができると共に、

短時間で開放させることが可能になる。従って、本発明によれば、開放時の反動によって落下させてしまうことを回避できると共に緩慢に開放される場合のストレスを解消することができる。また、これらの機能は、ヒンジ部の内部に装備した装置にて発揮することができるため、携帯電話機を大型化することなく実現することが可能である。さらには、開く際の動きにめりはりがあり、高級感を醸し出すことができる。

【図面の簡単な説明】

【図 1】 本発明の一実施例の全体構成示す斜視図。

【図 2】 本発明の一実施例の動作を説明するための側面図。

【図 3】 本発明の一実施例にて用いられるヒンジユニットのヒンジ部に装着された状態を示す断面図。

【図 4】 本発明の一実施例にて用いられるヒンジユニットとヒンジ部の分解斜視図。

【図 5】 本発明の一実施例にて用いられるダンパーユニットの分解斜視図と断面図。

【図 6】 本発明の一実施例のヒンジ部の分解斜視図とダンパーユニットの動作説明図。

【符号の説明】

- 11 第 1 の筐体
- 11a 円筒部
- 11b 平面カット部
- 11c 端部
- 11d キー
- 12 第 2 の筐体
- 12a 円筒部
- 12b 角度調節孔
- 12b-1 ~ 12b-4 角度調節孔の面
- 12c 平面カット部
- 12d 端部
- 13 ヒンジ部
- 14 ダンパーユニット
- 15 ヒンジユニット
- 16 ロック解除ボタン
- 16a ピン部
- 16b 先端部
- 16c フランジ部
- 31 軸体
- 31a 羽根
- 31b 略直方体部
- 31b-1、31b-2 略直方体部の面
- 31c スナップフィット
- 32 ケース
- 32a 平面カット部
- 33 ダンパー用オイル
- 34 キャップ
- 41 固定ディスク
- 41a、41b キー溝

11

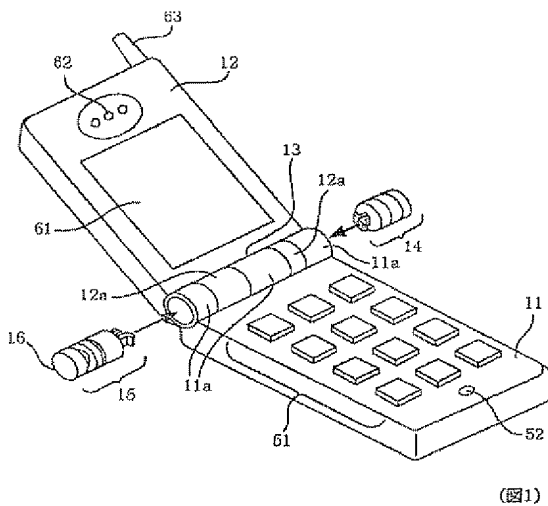
- 42 固定筒
- 42a スナッフフィット
- 42b 平面カット部
- 42c 長穴
- 42d 凹部
- 43 ねじりコイルばね
- 43a 折り曲げ部
- 44 第1のロック部材
- 44a キー
- 44b シャフト穴
- 44c 凸部
- 44d 凹部

12

- * 45 第2のロック部材
- 45a キー
- 45b シャフト部
- 45c 端面
- 45d 凹部
- 46 圧縮コイルばね
- 51 キーボタン
- 52 マイク
- 61 表示部
- 62 受話器
- 63 アンテナ

*

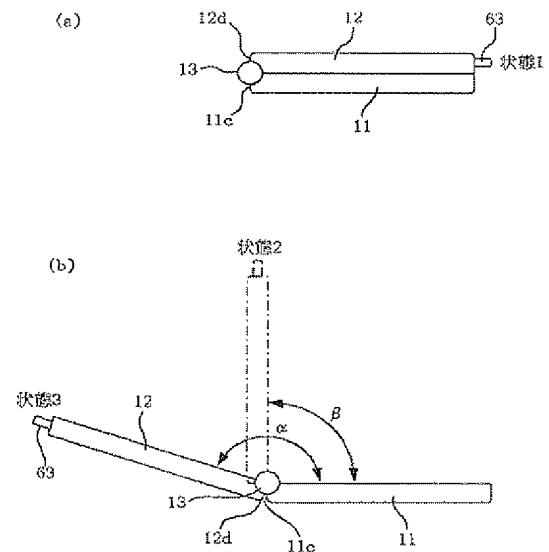
【図1】



(図1)

- | | | |
|----------|-------------|---------|
| 11 第1の筐体 | 14 ダンパーユニット | 52 マイク |
| 11a 円筒部 | 16 ヒンジユニット | 61 表示部 |
| 12 第2の筐体 | 18 ロック解除ボタン | 62 受話器 |
| 12a 円筒部 | 51 キーボタン | 63 アンテナ |
| 13 ヒンジ部 | | |

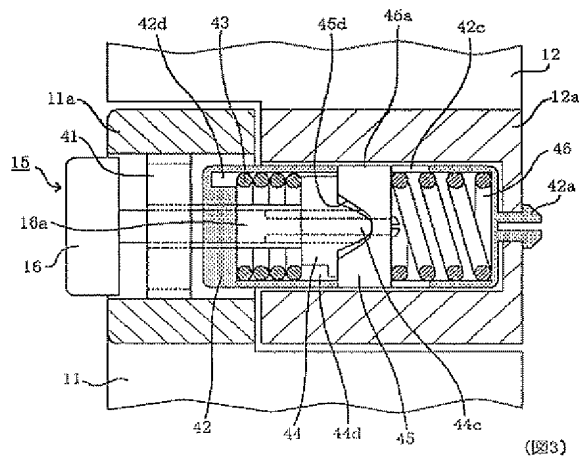
【図2】



11c、12d 端部

(図2)

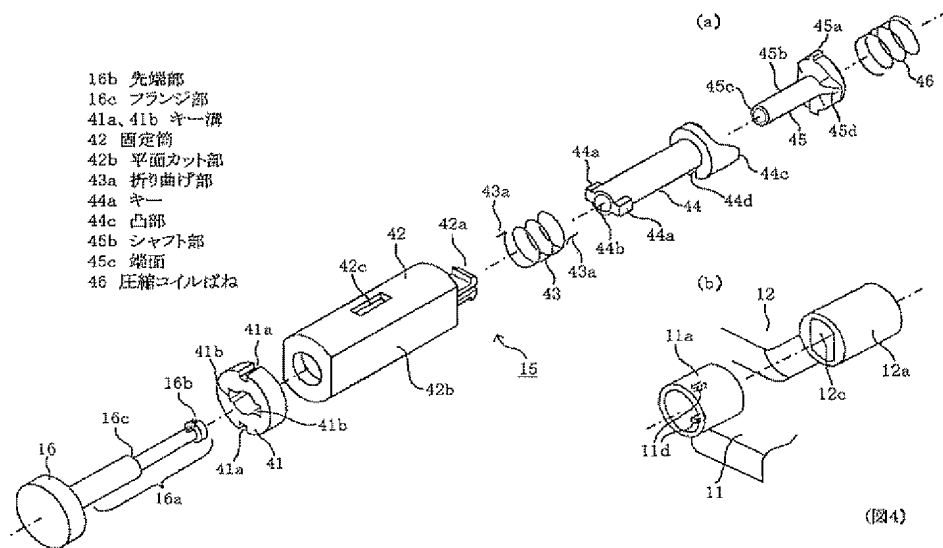
【図3】



(図3)

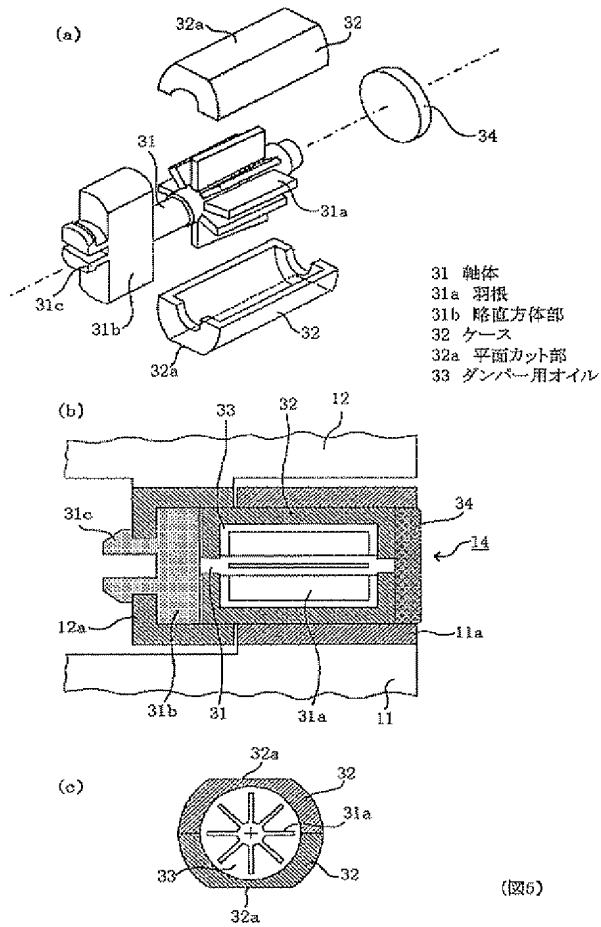
- | | | | |
|-----|----------|----------|----------|
| 43 | ねじりコイルばね | 16a | ピン部 |
| 44 | 第1のロック部材 | 41 | 固定ディスク |
| 44d | 凹部 | 42a | スナップフィット |
| 45 | 第2のロック部材 | 42c | 長穴 |
| 45a | キー | 42d, 45d | 凹部 |

【図4】

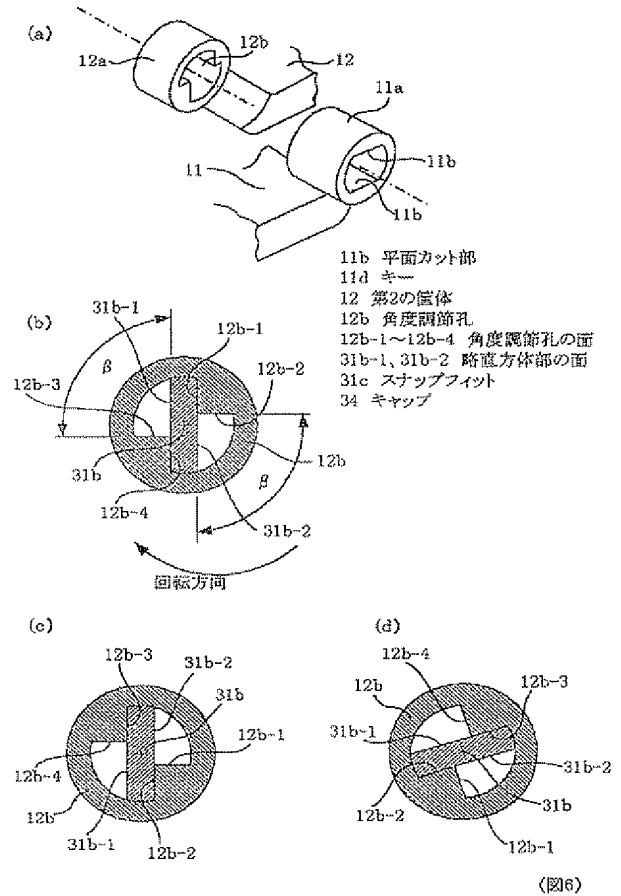


(図4)

【図5】



【図6】



フロントページの続き

Fターム(参考) 3J069 AA41 EE67
3J105 AA02 AA03 AA12 AB11 AB24
AC10 DA01 DA15 DA23
5K023 AA07 BB11 BB23 DD08 LL06
RR09